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ABSTRACT

This study investigated the use patterns of four CD-ROM systems--Newsbank Electronic Index, SilverPlatter's ERIC and PsycLIT, and Dissertation Abstracts Ondisc--and their print index counterparts in the University of Georgia (UGA) Main Library, which houses collections and provides library services for the humanities, the social sciences, and business. Questionnaires were developed for users of each of the CD-ROM and print indexes, and users were solicited at the point-of-use at randomly selected times over a 6-month period. Of the 200 questionnaires distributed, 169 (92.9%) were usable for the research sample. Of these, 157 were students and 12 were faculty or staff. The results of the survey suggest that there are users searching CD-ROM systems who have not previously used their print counterparts; one third were not aware of their existence. In addition, fewer than 20% of the CD-ROM users had ever used the end-user online search service or had a search performed by a librarian. CD-ROM users search these sources more often than the print users search the print indexes. Term papers and class assignments were the most common purposes for both groups. CD-ROM users search the print index less often than print users search the CD-ROMs. Most CD-ROM users reported that they preferred searching the CD-ROM systems because it is faster than using print indexes. Ease of use, inclusion of many years, and the ability to print results online were also given as reasons for using CD-ROM. The most cited reason for using print was that the CD-ROM was in use. Most of the users were graduate students and older and more likely to be female than the general UGA student population. Most users knew that both formats may yield citations to sources not held by the UGA libraries. Most users felt they were usually successful with their searches, and the great majority rated the guides, user's manuals, and help screens as adequate. Recommendations to the Reference Department and for further research conclude the report. Copies of the questionnaires and a letter of explanation to users are appended. (28 references) (BBM)

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A Study of the Use of CD-ROM Computer Systems and Print Indexes at the University of Georgia Main Library

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March 25, 1991

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A Study of the Use of CD-ROM Computer Systems and Print Indexes at the University of Georgia Main Library

The University of Georgia (UGA) Main Library houses collections and provides library services for the humanities, the social sciences, and business. End-user searching of bibliographic Compact Disc Read Only Memory (CD-ROM) systems began at the UGA Main Library in November 1988 with the introduction of Newsbank Electronic Index and SilverPlatter's ERIC and PsycLIT. Dissertation Abstracts Ondisc was made available to library users in January 1989; Compact Disclosure, a non-bibliographic financial database, had already been available in the Main Library prior to this.

Dissertation Abstracts Ondisc (DAO) contains bibliographic references to dissertations completed at accredited colleges and universities; its print predecessors are Dissertation Abstracts International (DAI) and the Comprehensive Dissertation Index. DAO also includes references from Masters Abstracts International. ERIC SilverPlatter (ERIC SP) contains bibliographic references and abstracts to journal articles and documents on education and related fields. ERIC SP corresponds to the print indexes Current Index to Journals in Education (CIJE) and Resources in Education (RIE). Newsbank Electronic Index (NEI) is the CD-ROM version of Newsbank Index (NI), an index to newspaper articles on microfiche. In addition to the general NI, NEI also contains the specialized Newsbank indexes,

such as Business Newsbank. PsycLIT (PSYCL) covers literature in psychology and related disciplines. PSYCL corresponds to the print index Psychological Abstracts (PSYCA). The UGA Main Library had subscriptions to each of these print indexes prior to receiving them in CD-ROM format.

Instruction for library users in the use of these CD-ROM systems has consisted of announced workshops and point-of-use assistance; when appropriate, demonstrations have been incorporated into library instruction sessions. In an effort to learn more about the library users and their use of the CD-ROM systems and their print counterparts, the author reviewed the literature and designed a study to examine the use patterns of these sources.

Literature Review

Much literature has been written in the past six years on CD-ROM technology (Barnes, 1988). Yet many of the articles have consisted of practical advice, such as factors to consider before purchasing CD-ROMs: hardware compatibility, software and programming needs, technical support, database quality, staff and end-user training, staffing needs, costs, and funding (Reese, 1990; Langlois, 1990; Bezanson, 1987). Several articles covering the particulars of specific systems have also been written (Reese & Steffey, 1987). Little empirical research has been done on CD-ROM systems in libraries and their effects on print and online sources (Salomon, 1988), and very few studies have explored end-users' attitudes toward CD-ROM technology (Salomon & Schultz, 1989).

Most of the user feedback from early CD-ROM test sites was positive and quite enthusiastic (Miller, 1987). Many of the users said that they were successful with their CD-ROM searches; they cited speed and the ability to browse for free as major advantages, and many said that they preferred the new computer systems to the print format. There were complaints, however, about lack of currency and problems with the hardware. Sweetland (1988) criticized these early "Beta tests" for having been conducted at test sites chosen, not at random, but for their eagerness to volunteer; thus, users at these libraries may not have been representative of the population as a whole.

Most studies of CD-ROM systems published in the library literature have relied upon surveys of users' ability to search InfoTrac and their perceived success in searching InfoTrac (Allen, 1989). Flynn (1989), for example, surveyed users of InfoTrac and found that the majority had successfully answered their question with InfoTrac, felt that InfoTrac was easy to use, and preferred it to other sources. Other users have had criticisms of InfoTrac's content, however: lack of currency, poor quality of data, and indexing problems (Miller, 1987). Hall, Talan, and Pease (1987) observed that users of InfoTrac frequently searched for topics beyond the system's scope of coverage, searched poorly, and tended not to ask for assistance. Reese (1988) conducted an experiment that compared the search results of students using Reader's Guide and students using InfoTrac; she found that a greater percentage of the students that used Reader's Guide were successful.

Several studies of users searching CD-ROM systems other than InfoTrac have nonetheless been published. Bezanson (1987) surveyed PSYCL users at an early test site. Of the 169 who responded to the survey, 86% had prior computer experience, 40% previously had an online search conducted for them by a librarian, and 39% had done their own online searches. Thirty-seven percent had used PSYCA. All but two of these users found PSYCL easier to search than its print counterpart. Sixty-two percent of the users were very satisfied with their search. Only two of the 169 users reported that they would not want to use PSYCL again.

Rholes and Caldwell-Wood (1987) surveyed 73 ERIC SP users at Texas A & M University. They found that users felt that formal instruction was not necessary for successful searches on ERIC SP. Most users felt that ERIC SP was easy to use and most were satisfied with it; 56% of the users did have some problems, however, with their searches. Forty-seven percent of the users had used print indexes previously; 34% had used BRS After Dark and 23% had used other CD-ROM systems in the library. The majority (54%) of ERIC SP searches took longer than 20 minutes. Eighty-five percent of the users felt that their searches were successful; only 33% of them had used the user's manual. Only 29% of ERIC SP users were in favor of cancelling the print indexes; 36% were strongly opposed and 22% were undecided.

Silver (1988) surveyed 100 CD-ROM users and found that 88% found the systems easy to learn and 95% found them easy to use. Seventy-four percent of the users were students. The users with

prior computer experience were less likely to require a librarian's assistance with the system and more likely to find relevant citations. However, these users were less satisfied with the response time of the CD-ROM systems.

Stewart and Olsen (1988) conducted an experiment that compared the search results of four groups of students: ERIC SP users who were given formal instruction, ERIC SP users who were not given formal instruction, CIJE/RIE users who were given formal instruction, and CIJE/RIE users who were not given formal instruction. (All had prior computer experience). The users were instructed to search for articles on one of seven topics. They found that users searching ERIC SP outperformed users searching CIJE/RIE, users formally instructed in ERIC SP outperformed those who had not been instructed, and 90.5% of the users preferred ERIC SP to CIJE/RIE. Fifty-three percent of the ERIC SP users found the CD-ROMs "very easy" to use, as opposed to only 18.9% of the CIJE/RIE users who found the print indexes very easy to use. Data on prior computer experience were inconclusive.

CD-ROM users at The Ohio State University Health Sciences Library were surveyed by LePoer and Mularski (1989). Sixty-four percent of the users who responded to the survey were students, 19% were staff members, 14% were faculty members, and 3% identified themselves as "other." This distribution was almost the opposite of that of the mediated search services, suggesting that CD-ROM systems tend to attract students, who have more time and less money than faculty members. Seventy-two percent of the

users identified themselves as experienced CD-ROM searchers. The majority of users learned of the CD-ROM systems through word-of-mouth advertising. Forty percent of the users said that they learned how to search the CD-ROM system from a library staff member, 28% taught themselves from the user manual, 15% learned by trial and error, and 9% were helped by colleagues. Most of the experienced users (58%) occasionally asked for help from the library staff; 19% never asked for assistance. Most users were satisfied with three out of four citations resulting from their searches. Forty-nine percent of the users found the CD-ROM system useful for their research projects, 46% used it for class assignments, and 25% used it to obtain patient care information. Finally, most of the users reported that they searched CD-ROM systems because they are convenient (91%), yield quick results (80%), and are free (77%).

Salomon and Schultz (1989) conducted a study wherein students in business, education, and psychology courses were asked to use Business Periodicals Index, ERIC SP, and PSYCL, respectively, plus their print counterparts. They were then surveyed about CD-ROM use, difficulty, assistance, and results. Sixty percent indicated that they were satisfied with the results from their CD-ROM search, and 70% felt that the print indexes were more difficult to use than the CD-ROM. When asked if the CD-ROM were busy, 60% said that they would rather wait than use the print format. However, 62% indicated that the library should not cancel the print indexes; 24% were "neutral." Only 36% of the students felt that instruction by a librarian is necessary

before successfully using a CD-ROM system and 39% did not request assistance from a librarian; 86% learned the most from the help screens. Eighty-five percent of the students indicated that they would prefer the CD-ROM for browsing through a list of references (Schultz & Salomon, 1990).

Two surveys conducted at the Education Library at Vanderbilt University were reported by Reese (1989). CIJE/RIE, PSYCA, and DAI were the most popular indexes in this library, and ERIC SP was the most popular CD-ROM source. Sixty-eight percent of the users were graduate students; only 7% were faculty. The majority of the users had some experience with computers, most found the systems easy to use, and 77% were satisfied with their searches. Forty percent were working on a research paper and 28% were working on a thesis or dissertation. It was found that 68.5% of users learned to search the CD-ROM systems through the manual, and 9.4% learned through the help screens. Only 0.4% leaned from the library staff; 6% had taught themselves by trial and error (Reese, 1990). One third of the users took 30 to 60 minutes to conduct their search, and all users believed that they had saved time by using the CD-ROM systems (Reese, 1989).

Steffey and Meyer (1989) surveyed over 600 CD-ROM users at all of Vanderbilt University's libraries, which had at the time of their survey 21 CD-ROM workstations with over 40 products available. Overall, 48% of the users were undergraduates, 38% were graduate students, 7% were faculty, 4% were staff, and 5% were "other." The most significant variable found was previous computer experience. The largest percentage of users were doing

a class assignment (37.6%) or a research paper (44%) when searching the CD-ROMs. Fifty-nine percent of ERIC SP users had used the print format; however, 54% of the PSYCL users had not. Only 6% of the CD-ROM users indicated that they preferred the print indexes over CD-ROM. Nearly 40% of the users spent 15 minutes or less on their CD-ROM search, and over 33% spent 15 to 30 minutes. Most felt that a print search would have taken longer than the CD-ROM.

Allen (1989) examined the use of workstations equipped with InfoTrac, Readers' Guide, and eight other Wilsondisc systems at the University of Illinois. Users agreed very strongly that CD-ROM systems are easy to use and do not require training or instruction, but they were unsure if they had successfully answered their research questions. They strongly agreed that they preferred CD-ROMs to print indexes. Longer searches tended to be more successful. Allen found significant differences among the users by gender; males had a less positive opinion of their search results, and were more persistent in searching. Allen also found significant differences between the users of InfoTrac and Wilsondisc; InfoTrac users were less successful. InfoTrac was the most heavily used database.

Various studies have confirmed that users have difficulty using Boolean logic, analyzing concepts, selecting appropriate search terminology, and modifying searches (Harter & Jackson, 1988). For example, Charles and Clark (1990) observed users of Agricola on CD-ROM and found that most of them needed a great deal of help. Many of these users had difficulty with the

selection of appropriate search terms, few used Boolean operators and truncation, and none limited their searches to a specific field. Many of the users in the study were surprised to learn that the CD-ROM format was not as current as its online counterpart. Charles and Clark noted that "In our enthusiasm to embrace CD-ROM technology, librarians have neglected to make patrons aware of its drawbacks" (p. 327). The appropriateness of database selection by CD-ROM users, as determined by three independent judges, was examined by Allen (1990). Allen found that one only user in five used the most appropriate CD-ROM database available, while one in five used an entirely inappropriate database. Experience in searching had no effect on appropriate database selection. A central question for librarians is whether or not a CD-ROM system can be used effectively by the audience for whom its purchase is intended (Harter & Jackson, 1988).

Belanger and Hoffman (1990) examined factors related to the frequency of use of ERIC SP. Testing the findings of previous research done with online catalog use, they examined gender, age, prior computer experience, and student status as factors. They found statistically significant relationships between both gender and computer familiarity and frequency of ERIC SP use; males and users more familiar with computers tended to use ERIC SP more frequently. No significant relationship was found between student status and frequency of use.

Salomon (1988) surveyed academic librarians and found that CD-ROM systems were catching on faster than end-user online

services. Librarians at libraries that had CD-ROM systems were more likely to believe that users do not need to see the print source before using the CD-ROM, that money from the book budget should be used to purchase CD-ROM sources, and that CD-ROM systems will mean more work for reference personnel.

A recent survey (Foulds & Foulds, 1991) conducted in Britain and Ireland found librarians reporting that only 13% of CD-ROM users download, the majority printing their results directly.

A review of the literature found several studies that surveyed users' reactions to CD-ROM technology and several that examined their use of CD-ROM systems, including DAO, ERIC SP, and PSYCL. No studies of NEI or NI were found. Only three studies were found (Reese, 1988; Stewart & Olsen, 1988; Salomon & Schultz, 1989) that specifically compared the use of CD-ROM systems to the use of print indexes; each of these were controlled experiments. The author felt that it would be useful to examine the use of DAO, ERIC SP, NEI, PSYCL, and their print counterparts as users were searching them. Some of the questions addressed in previous studies were included in this study.

Purpose of the Study

The purpose of the study was to investigate the use patterns of the four CD-ROM systems and their print index counterparts. The study addressed the following research questions:

1. Are the CD-ROM systems being searched by users who have not previously used the print indexes or other online services?

2. How often do users search their source?

3. For what purpose are users searching their source?

4. What other computer systems in the library have users searched?

5. Are users aware of the alternative format of their source?

6. How often do users search the alternative format?

7a. Why are CD-ROM users searching the CD-ROM system rather than the print format?

7b. Why are print index users searching the print index rather than the CD-ROM format?

8. What are the status, department, age, and gender of the users?

9. Are users aware that the CD-ROM systems and print indexes may yield citations to sources that the library may not own?

10. Do users feel that they are usually successful with their searches?

11. Do users feel that the guides, user's manuals, and help screens are adequate?

Method of Study

Survey instruments consisting of questionnaires with 17 questions were developed for users of the CD-ROM systems, DAO, ERIC SP, NEI, PSYCL; and users of the print indexes, DAI, CIJE, RIE, NI, PSYCA (see Appendices A and B). DAI was regarded as including Comprehensive Dissertation Index as well as Dissertation Abstracts International.

The survey method consisted of soliciting users at point-of-use in the Main Library Reference Department. The questionnaires were distributed to users at randomly selected

times between October 1, 1989 and March 31, 1990. These randomly selected times occurred during all hours that the Main Library Reference Desk is open: Monday through Thursday, 8 a.m. to 10 p.m.; Fridays, 8 a.m. to 6 p.m.; Saturdays, 9 a.m. to 6 p.m.; Sundays, 1 p.m. to 10 p.m. In addition to surveying users seated at the computer terminals and at the index tables, the author walked throughout the Reference Department to see if any users had taken an index to a study table, or were using an older index volume from the reference stacks. Users at the computer or index were asked if they wished to participate in the study. The author introduced himself as one of the reference librarians, and suggested that the results would help to improve library services. If the user declined to participate, the next user would be asked. As they were being interrupted, they were told that they could complete the questionnaire when they were finished using the computer or index and return it at a later time.

Two hundred questionnaires were distributed; 14 library users either declined to participate or failed to return their questionnaires: 186 questionnaires were received, a return rate of 93%. Of these remaining questionnaires, 17 had to be discarded because they were either incompletely or incorrectly filled out. This left 169 usable questionnaires for the research sample. Of these 169 users, 157 (92.9%) were students and 12 (7.1%) were faculty or staff members; 122 (72.19%) were female. The totals received for each specific source are shown in Table 1. For the CD-ROM sources, 17 were received from DAO users, 45

from ERIC SP users, 16 from NEI users, and 46 from PSYCL users for a total of 124. For the print sources, 4 were received from DAI users, 10 from CIJE users, 4 from RIE users, 0 from Newsbank Index users, and 27 from PSYCA users for a total of 45. Hereafter, data from CIJE and RIE will be combined into one set and be regarded as one source, and will be referred to as

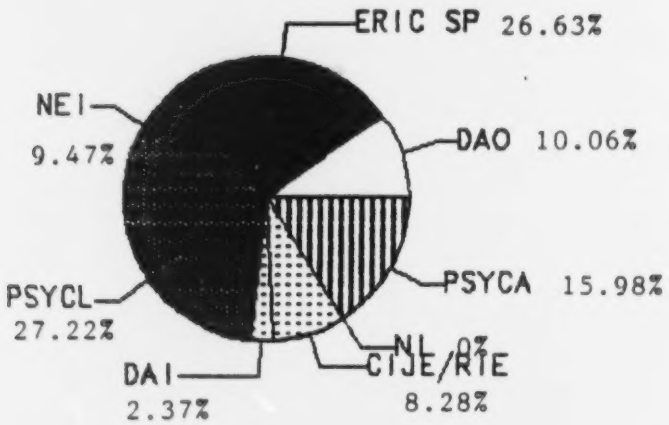
Table 1

Questionnaires Received by Source

source	n	%
DAO	17	10.06
ERIC SP	45	26.63
NEI	16	9.47
PSYCL	46	27.22
CD-ROM TOTAL	124	73.37
DAI	4	2.37
CIJE/RIE	14	8.28
NI	0	0.00
PSYCA	27	15.98
INDEX TOTAL	45	26.63
SURVEY TOTAL	169	100.00

DAO: Dissertation Abstracts Ondisc; ERIC SP: ERIC SilverPlatter; NEI: Newsbank Electronic Index; PSYCL: PsycLIT; DAI: Dissertation Abstracts International; CIJE/RIE: Current Index to Journals in Education and Resources in Education; NI: Newsbank Index; PSYCA: Psychological Abstracts.

Figure 1 Questionnaires Received by Source



CIJE/RIE. Figure 1 shows the percentage of the total received for each source.

Results of Study

Sufficient data were gathered to provide answers to the research questions stated above.

1. Are the CD-ROM systems being searched by users who have not previously used the print indexes or other online services?

Of the 124 CD-ROM users, 42 (33.87%) were not aware of the print format of their source. The results ranged from a low of 23.53% of DAO users to a high of 56.25% of NEI users (see Table 6). Prior to the introduction of these CD-ROM sources, the UGA library offered fee-based mediated searches on DIALOG and BRS, and fee-based searches on the BRS After Dark end-user system (called "Sherlock"). Table 5 shows that only 12.10% of CD-ROM users had previously used the Sherlock service and only 16.13% had ever had a mediated database search done by a librarian. No DAO users and no NEI users had ever used Sherlock, and no NEI users had used the mediated search services. These results

suggest that the CD-ROM systems, especially NEI, are being searched by users who have not searched the print format of their source and have not used other library online services. These findings lend support to the observation of Silverman (1990) that CD-ROM systems result in an increase in library use by drawing new users into the library.

2. How often do users search their source?

One of the survey questions asked users how often they used these sources (see Table 2). Results suggest that the CD-ROM sources are used more often than the print sources. A total of 7.26% of the CD-ROM users use their source more than once per week, versus 4.44% of the print index users; 24.19% of the CD-ROM users and 15.56% of the print users search about once per week; 33.06% of the CD-ROM users and 26.67% of the print users search about once per month; 14.52% of the CD-ROM and 26.67% of the print users search about once per quarter; 1.61% of the CD-ROM users and 6.67% of the print users search their sources less than once per quarter. Thus, 64.51% of CD-ROM users search the CD-ROMs once per month or more, whereas only 46.67% of print users search as often; one third (33.34%) of print users search their sources once per quarter or less. There was little difference between the two groups for first time use: 19.35% of the CD-ROM group and 20% of the print group.

3. For what purpose are users searching their source?

Those users who had previously used the CD-ROM or index were asked "for what purpose do you usually use this system (index)?". Users were not asked to check more than one response, but many

Table 2

Frequency of Use of CD-ROM Systems and Print Indexes

	MORE THAN ONCE PER WEEK		ONCE PER WEEK		ONCE PER MONTH		ONCE PER QUARTER		LESS THAN ONCE PER QUARTER		THIS IS THE FIRST TIME	
source	n	%	n	%	n	%	n	%	n	%	n	%
DAO n=17	0	0.00	3	17.65	4	23.53	3	17.65	1	5.88	6	35.29
ERIC SP n=45	4	8.89	12	26.67	15	33.33	4	8.89	0	0.00	10	22.22
NEI n=16	1	6.25	4	25.00	4	25.00	4	25.00	1	6.25	2	12.50
PSYCL n=46	4	8.70	11	23.91	18	39.13	7	15.22	0	0.00	6	13.04
TOTAL		7.26		24.19		33.06		14.52		1.61		19.35
DAI n=4	0	0.00	1	25.00	0	0.00	2	50.00	1	25.00	0	0.00
CIJE/RIE n=14	1	7.14	1	7.14	4	28.57	1	7.14	1	7.14	6	42.86
PSYCA n=27	1	3.70	5	18.52	8	29.63	9	33.33	1	3.70	3	11.11
TOTAL		4.44		15.56		26.67		26.67		6.67		20.00

did so (see Table 3). The possible choices were "term paper," "class assignment," "Honors/Masters thesis," "dissertation," "research for a publication," and "other." Among the CD-ROM users, both "term paper" and "class assignment" were chosen by 40% of the CD-ROM users. Thirty-one percent of the CD-ROM users chose "research for a publication," 27% chose "dissertation," 22% chose "thesis," and 19% chose "other." "Class assignment" was chosen by 55.56% of the print users; 38.89% chose "term paper," 16.67% chose "other," 13.89% chose "dissertation," 11.11% chose "research for a publication," and 5.56% chose "thesis."

The next survey question asked all users "for what purpose are you using it at this moment?". The response with the highest percentage of both CD-ROM and print users was "class assignment" (see Table 4); 27.42% of the CD-ROM users and 53.33% of the print users. Second for both groups of users was "term paper," chosen by 22.58% of CD-ROM users and 28.89% of print users. Third was "dissertation," chosen by 19.35% of CD-ROM users and 11.11% of print users. "Thesis" was chosen by 8.87% of the CD-ROM users and 4.44% of the print users; "research for a publication" was chosen by 17.74% of the CD-ROM users and 2.22% of the print users; "other" was chosen by 16.13% of the CD-ROM users and 6.67% of print users.

Users' purposes varied by individual source a great deal. As one could expect, the majority of DAO and DAI users gave "dissertation" as their purpose: 63.64% of the CD-ROM users and 50% of the print users (see Table 3). Approximately three-fourths of the DAO and DAI users indicated "dissertation" or

Table 3

Usual Purpose of Users for Searching CD-ROM or Print Source

	TERM PAPER		ASSIGNMENT		THESIS		DISSERTATION		RESEARCH FOR A PUBLICATION		OTHER	
source	n	%	n	%	n	%	n	%	n	%	n	%
DAO n=11	0	0.00	0	0.00	1	9.09	7	63.64	1	9.09	2	18.18
ERIC SP n=35*	17	48.57	17	48.57	8	22.86	12	34.29	13	37.14	4	11.43
NEI n=14*	5	35.71	7	50.00	0	0.00	0	0.00	2	14.29	5	35.71
PSYCL n=40*	18	45.00	16	40.00	13	32.50	8	20.00	15	37.50	8	20.00
TOTAL		40.00		40.00		22.00		27.00		31.00		19.00
DAI n=4	0	0.00	0	0.00	1	25.00	2	50.00	1	25.00	0	0.00
CIJE/RIE n=8*	2	25.00	6	75.00	0	0.00	1	12.50	1	12.50	3	37.50
PSYCA n=24*	12	50.00	14	58.33	1	4.17	2	8.33	2	8.33	3	12.50
TOTAL		38.89		55.56		5.56		13.89		11.11		16.67

*several users gave more than one answer

Table 4

Purpose for Searching Source at Time of Study

	TERM PAPER		ASSIGNMENT		THESIS		DISSERTATION		RESEARCH FOR A PUBLICATION		OTHER	
source	n	%	n	%	n	%	n	%	n	%	n	%
DAO n=17	0	0.00	1	5.88	2	11.76	11	64.71	1	5.88	2	11.76
ERIC SP n=45*	9	20.00	12	26.67	2	4.44	9	20.00	10	22.22	5	11.11
NEI n=16*	5	31.25	6	37.50	0	0.00	0	0.00	2	12.50	5	31.25
PSYCL n=46*	14	30.43	15	32.61	7	15.22	4	8.70	9	19.57	8	17.39
TOTAL		22.58		27.42		8.87		19.35		17.74		16.13
DAI n=4*	0	0.00	1	25.00	1	25.00	2	50.00	1	25.00	0	0.00
CIJE/RIE n=14	4	28.57	7	50.00	0	0.00	2	14.29	0	0.00	1	7.14
PSYCA n=27*	9	33.33	16	59.26	1	3.70	1	3.70	0	0.00	2	7.41
TOTAL		28.89		53.33		4.44		11.11		2.22		6.67

*several users gave more than one answer

"thesis" as their purpose. No NEI users were working on a thesis or dissertation; 85.71% of NEI users chose either "term paper" or "class assignment" as their usual purpose. The other category receiving a large percentage from NEI users was "other"; 35.71%, more than any other source.

The total responses on both survey questions added up to greater than 100%, indicating that many users search their source for more than one purpose. On both questions, the results were greater for the CD-ROM users, suggesting that this is especially true of these users.

4. What other computer systems in the library have users searched?

All users were asked "what other computer systems in the library have you used?". The possible responses were "online catalog," "InfoTrac," "Sherlock," "database search done by a librarian," "other (please describe)," and "none" (see Table 5). The vast majority of the users of each source had used the online catalog: 88.71% of the CD-ROM users and 82.22% of the print users checked this response. For the individual sources, the percentages ranged from a low of 71.43% of the CIJE/RIE users to a high of 95.65% of the PSYCL users. The computer system that had been searched second most often was InfoTrac; 46.77% of the CD-ROM users and 24.44% of the print users had used it. Users of NEI were most likely to have used InfoTrac before; 81.25% of them checked this response. The CD-ROM users were more likely than the print users to have used Sherlock (BRS After Dark), UGA's fee-based online services, or another CD-ROM system (with the exception of NEI users, none of whom had used Sherlock or online

Table 5

Use of Other Computer Systems in the UGA library

	ONLINE CATALOG		INFOTRAC		SHERLOCK		DATABASE SEARCH		OTHER		NONE	
source	n	%	n	%	n	%	n	%	n	%	n	%
DAO n=17	13	76.47	9	52.94	0	0.00	6	35.29	8	47.06	2	11.76
ERIC SP n=45	40	88.89	17	37.78	10	22.22	9	20.00	14	31.11	1	2.22
NEI n=16	13	81.25	13	81.25	0	0.00	0	0.00	3	18.75	1	6.25
PSYCL n=46	44	95.65	19	41.30	5	10.87	5	10.87	10	21.74	1	2.17
TOTAL		88.71		46.77		12.10		16.13		28.23		4.03
DAI n=4	3	75.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00
CIJE/RIE n=14	10	71.43	4	28.57	0	0.00	0	0.00	2	14.29	2	14.29
PSYCA n=27	24	88.89	6	22.22	0	0.00	1	3.70	1	3.70	3	11.11
TOTAL		82.22		24.44		0.00		2.22		6.67		13.33

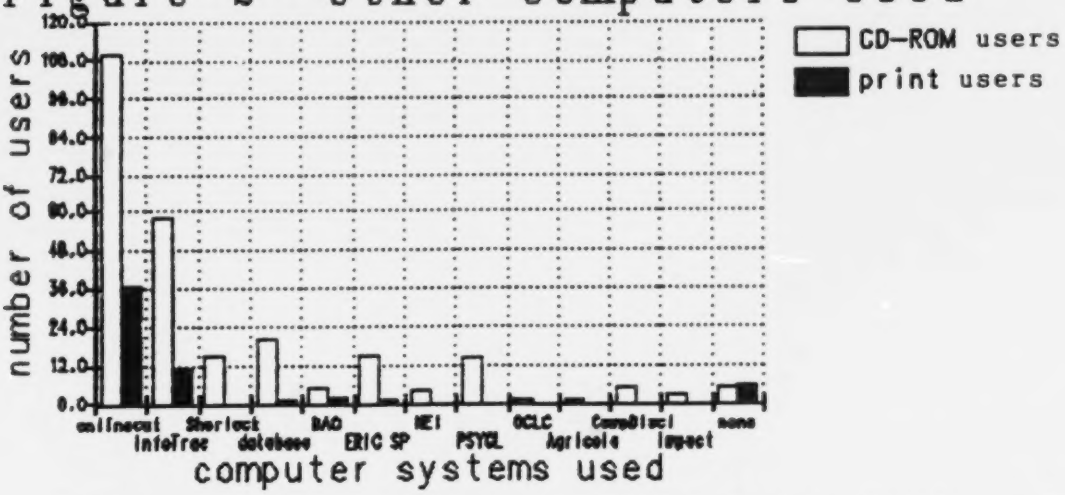
DATABASE SEARCH: "database search done by a librarian"

*users were asked to check all applicable answers

services and who also had the lowest percentage for "other"). None of the print users had ever used Sherlock, and only one had ever had a "database search done by a librarian." Finally, 28.23% of the CD-ROM users checked "other", in contrast to only 6.67% of the print users.

Various computer systems were included in the "other" category (see Figure 2). Five CD-ROM users and two print users had used DAO (not including DAO or DAI users), and fifteen CD-ROM users and one print user had used ERIC SP. Four CD-ROM users had used NEI, fourteen had used PSYCL, one had used OCLC, one had used Agricola, five had used Compact Disclosure, and three had used Impact; no print users had used any of these sources. Print users were more likely than CD-ROM users to have checked "none"; 13.33% of the print users gave this answer in contrast to only 4.03% of the CD-ROM users.

Figure 2 Other Computers Used



ONLINECAT: online catalog; COMPDISCL: Compact Disclosure
DATABASE: database search done by a librarian

5. Are users aware of the alternative format of their source?

All users were asked about their awareness of the alternative format of the source they were using, i.e., the CD-ROM users were asked "Did you know that there is a print (non-computer) version of this system?". The majority of users of most sources answered "yes" (see Table 6): 66.13% of CD-ROM

Table 6

Users' Awareness of the Alternative Format of Their Source

	YES		NO	
source	n	%	n	%
DAO n=17	13	76.47	4	23.53
ERIC SP n=45	33	73.33	12	26.67
NEI n=16	7	43.75	9	56.25
PSYCL n=46	29	63.04	17	36.96
TOTAL		66.13		33.87
DAI n=4	3	75.00	1	25.00
CIJE/RIE n=14	10	71.43	4	28.57
PSYCA n=27	10	37.04	17	62.96
TOTAL		51.11		48.89

users and 51.11% of print users. Users of DAO (76.47%) and DAI (75%) were most likely to know of the alternative format. The least likely to know were users of PSYCA; only 37.04% of them answered "yes." Almost half of all print users, 48.89%, were unaware that there was a computerized version of the index. The other source with a majority of users being unaware of the alternative format was NEI; 56.25% answered "no."

A possible explanation for the large number of PSYCA users being unaware of CD-ROM format is the fact that each year there are assignments in undergraduate psychology and speech communication survey courses in which the students are specifically instructed to use "Psychological Abstracts" to find articles. Table 11 shows that 51.85% of the PSYCA users were undergraduates. When the students ask to be shown PSYCA, it may be that reference librarians forget to point out the CD-ROM format; moreover, the PSYCL terminal is almost constantly in use and it is probably easier to show the students the printed index.

6. How often do users search the alternative format?

Those users who knew about the alternative format were asked how often they used the alternative. The data shown in Table 7 suggest that CD-ROM users search the print format less often than print users search the CD-ROM format. Only 19.52% of CD-ROM users search the print version once per month or more, versus 34.79% of the print users. On the other hand, 47.83% of the print users reported using the CD-ROM version "less than once per quarter"; 17.07% of the CD-ROM users gave this answer. The most significant difference in usage reported was found with the

Table 7

Frequency of Use of Alternative Format of Source

	MORE THAN ONCE PER WEEK		ONCE PER WEEK		ONCE PER MONTH		ONCE PER QUARTER		LESS THAN ONCE PER QUARTER		DON'T USE IT ANYMORE	
source	n	%	n	%	n	%	n	%	n	%	n	%
DAO n=13	0	0.00	0	0.00	4	30.77	2	15.38	4	30.77	3	23.08
ERIC SP n=33	2	6.06	4	12.12	3	9.09	8	24.24	4	12.12	12	36.36
NEI n=7	0	0.00	1	14.29	0	0.00	1	14.29	4	57.14	1	14.29
PSYCL n=29	0	0.00	0	0.00	2	6.90	10	34.48	2	6.90	15	51.72
TOTAL		2.44		6.10		10.98		25.61		17.07		37.80
DAI n=3	0	0.00	0	0.00	1	33.33	1	33.33	1	33.33	0	0.00
CIJE/RIE n=10	1	10.00	1	10.00	2	20.00	1	10.00	4	40.00	1	10.00
PSYCA n=10	0	0.00	1	10.00	2	20.00	0	0.00	6	60.00	1	10.00
TOTAL		4.35		8.70		21.74		8.70		47.83		8.70

response "don't use it anymore"; 37.80% of the CD-ROM users gave this answer, whereas only 8.70% of the print users did. Thus, more than one third of the CD-ROM users familiar with the print format have stopped using it. The two sources with the greatest number of users who have given up using the print format were PSYCL (51.72%) and ERIC SP (36.36%).

Table 8

Number of Users Who Search Their Source More Often Than the Alternative Format

	YES		NO	
source	n	%	n	%
DAO n=10	6	60.00	4	40.00
ERIC SP n=21	13	61.90	8	38.10
NEI n=6	4	66.67	2	33.33
PSYCL n=14	9	64.29	5	35.71
TOTAL		62.75		37.25
DAI n=3	3	100.00	0	0.00
CIJE/RIE n=9	7	77.78	2	22.22
PSYCA n=9	8	88.89	1	11.11
TOTAL		85.71		14.29

When these data are compared to the results shown in Table 2, we see that the users in this survey use the alternative format less often than the source at which they were surveyed. The difference in usage is especially great for the CD-ROM users: 64.51% of the CD-ROM users searched their CD-ROM source at least once per month or more; only 19.52% of them used the print counterparts that often. The gap was much narrower between print and CD-ROM use by the print users; 46.67% used the print sources once per month or more, while 34.79% used the CD-ROM sources that often.

Another survey question asked these users if they used the source that they were searching more often than the alternative format, with "yes" and "no" as the possible responses (see Table 8). The results indicate that the majority of users of each source responded "yes": 62.75% of the CD-ROM users and 85.71% of the print users. The results for individual sorces ranged from 60% of DAO users to 100% of DAI users. The purpose behind this question was to seek a non-ambiguous answer as to whether or not users used one format more than the other; a user may have responded "less than once per quarter" in both Tables 7 and 8, yet he or she still makes use of one format more often than the other.

7a. Why are CD-ROM users searching the CD-ROM system rather than the print format?

Assuming that there are different advantages to computer and print sources, the two groups of users were given different possible responses, although some were the same. CD-ROM users were asked "Why are you using the computer rather than the print

version?", and told to check all applicable reasons (see Tables 9a and 9b). The most popular reason was the first choice, "it's faster"; 91.46% of the CD-ROM users checked this answer. This was the first choice of the users of each source. "Easier to use" was chosen by 67.07%, 63.41% chose "can search more years at once," and 58.54%, the majority for each CD-ROM source, chose "I can print the information rather than write it down." "Can be searched in more ways" was chosen by approximately half of the users, 52.44%. The choice "more current" was a deceptive answer, since the CD-ROM sources are actually not updated as often as their print equivalents. For example, CIJE/RIE and PSYCA are issued monthly, whereas the CD-ROMs are only updated quarterly; 24.39% chose this answer, ranging from a low of 15.38% for DAO to a high of 28.57% for NEI users. Either most users realize that the CD-ROM systems are not as current as their print counterparts, or currency is not an important reason to them.

Another advantage of the CD-ROM systems over their print counterparts is that they often index more types of documents. For example, ERIC SP combines the journal citations of CIJE and the documents of RIE, DAO contains Masters Abstracts International in addition to doctoral dissertations, and NEI contains the general NI as well as the various specialized indexes. PSYCL includes foreign language documents whereas PSYCA contains only English language documents. Thus, "contains more types of sources" would seem to be an important advantage, yet only 20.73% chose this reason.

Are users using the CD-ROM system because a librarian,

Table 9a

Reasons of CD-ROM Users for Searching CD-ROM Systems Instead of Print Indexes*

	IT'S FASTER		MORE CURRENT		EASIER TO USE		MORE YEARS		MORE TYPES OF SOURCES	
source	n	%	n	%	n	%	n	%	n	%
DAO n=13	13	100.00	2	15.38	8	61.54	8	61.54	1	7.69
ERIC SP n=33	28	84.85	8	24.24	22	66.67	21	63.64	9	27.27
NEI n=7	6	85.71	2	28.57	5	71.43	4	57.14	2	28.57
PSYCL n=29	28	96.55	8	27.59	20	68.97	19	65.52	5	17.24
TOTAL		91.46		24.39		67.07		63.41		20.73

Table 9b

	CAN BE SEARCHED IN MORE WAYS		PRINT IN USE		LIBRARIAN RECOMMENDED		PROF/FRIEND RECOMMENDED		PRINT ONLINE		OTHER	
source	n	%	n	%	n	%	n	%	n	%	n	%
DAO n=13	7	53.85	0	0.00	0	0.00	2	15.38	7	53.85	1	7.69
ERIC SP n=33	15	45.45	1	3.03	1	3.03	6	18.18	19	57.58	3	9.09
NEI n=7	3	42.86	1	14.29	0	0.00	1	14.29	4	57.14	0	0.00
PSYCL n=29	18	62.07	0	0.00	0	0.00	3	10.34	18	62.07	2	6.90
TOTAL		52.44		2.44		1.22		14.63		58.54		7.32

MORE YEARS: "can search more years at once"; PRINT IN USE: "print source was being used"; LIBRARIAN RECOMMENDED: the librarian recommended it"; PROF/FRIEND RECOMMENDED: "a professor, colleague or friend recommended it"; PRINT ONLINE: "I can print out the information rather than write it down."

*users were asked to check all applicable reasons.

professor, colleague, or friend recommended it to them? The results suggest that very few do so because a librarian recommended it; only one user (1.22%) checked this answer. They were more likely to choose "a professor, colleague, or friend recommended it"; 14.63% gave this response. A study by Clark and Silverman (1989) found that 66% of faculty members recommended online searching to their students. A few (7.32%) chose "other" and wrote in their reasons. One DAO user mentioned the highlighted keywords as helpful and faster. Two ERIC SP users wrote that they were using it for the first time and had wanted to try it; another user wrote "it is fun!" One PSYCL user wrote "cross references" and another wrote that the computer can tell them in seconds if their combination of keywords retrieves anything.

7b. Why are print index users searching the print index rather than the CD-ROM format?

The print users who were aware of the CD-ROM systems were asked "why are you using the index rather than the computer version?". Tables 10a and 10b show that the most chosen response was "computer was being used"; 47.83% of the print users chose this reason (60% of the CIJE/RIE users chose it). Of the eleven users who included "computer was being used" as a reason for using the print source rather than the CD-ROM, seven (63.64%) chose it as the only reason. For the purposes of comparison, the CD-ROM users were given "print source was being used" as a choice; only two users, 2.44%, chose this response. No users chose "computer was down." The responses "easier to use," "can browse easier," and "I'm more comfortable with it" were each

Table 10a

Reasons of Print Users for Searching Print Indexes Rather Than CD-ROM Systems*

	MORE CURRENT		EASIER TO USE		CAN BROWSE EASIER		INCLUDES MORE YEARS		MORE TYPES OF SOURCES	
source	n	%	n	%	n	%	n	%	n	%
DAI n=3	0	0.00	1	33.33	1	33.33	0	0.00	0	0.00
CIJE/RIE n=10	0	0.00	3	30.00	4	40.00	0	0.00	1	10.00
PSYCA n=10	0	0.00	3	30.00	2	20.00	0	0.00	0	0.00
TOTAL		0.00		30.43		30.43		0.00		4.35

Table 10b

	COMPUTER IN USE		COMPUTER WAS DOWN		MORE COMFORTABLE		LIBRARIAN RECOMMENDED		PROF/FRIEND RECOMMENDED		OTHER	
source	n	%	n	%	n	%	n	%	n	%	n	%
DAI n=3	1	33.33	0	0.00	1	33.33	0	0.00	0	0.00	0	0.00
CIJE/RIE n=10	6	60.00	0	0.00	1	10.00	2	20.00	1	10.00	1	10.00
PSYCA n=10	4	40.00	0	0.00	5	50.00	1	10.00	0	0.00	1	10.00
TOTAL		47.83		0.00		30.43		13.04		4.35		8.70

MORE COMFORTABLE: "I'm more comfortable with it"

*users were asked to check all applicable reasons

chosen by 30.43% of print users. As with the CD-ROM users, very few users indicated that they preferred the print sources because someone had recommended it to them (see Table 9b). Yet the print sources were more likely than the CD-ROM sources to have been recommended by a librarian; 13.04% chose "the librarian recommended it" and only one user (4.35%) chose "a professor, colleague or friend recommended it." As demonstrated in Table 9a, "more types of sources" was a deceptive answer; the print sources generally do not have the variety of documents that the CD-ROM sources have. Only one user (4.35%) chose this response. Despite the fact that the print sources are updated more frequently than the CD-ROM sources, no print user chose "more current." Some of the CD-ROM sources are not as retrospective as their print counterparts; for example, PSYCA goes back to 1927, whereas PSYCL only goes back to 1974. (DAO includes citations back to 1861 as does Comprehensive Dissertation Index, but with no abstracts before 1970). Yet no user chose "includes more years" as a reason for using the print source. Only two users chose "other"; one of them, a PSYCL user, wrote "not sure how to use computer."

8. What are the status, department, age, and gender of the users?

Table 11 and Figure 3 show that the majority of both CD-ROM users and print users indicated "graduate" as their status, 67.46% of the CD-ROM users and 57.78% of the print users. The majority of users of each source were graduate students, with the exceptions of NEI (only 18.75%) and PSYCA (44.44%). The second largest catagory was "undergraduate"; 23.02% of the CD-ROM users

Table 11

Status of Users

	UNDERGRADUATE		GRADUATE		FACULTY		STAFF		OTHER	
source	n	%	n	%	n	%	n	%	n	%
DAO n=19*	0	0.00	13	68.42	2	10.53	3	15.79	1	5.26
ERIC SP n=46*	5	10.87	39	84.78	1	2.17	1	2.17	0	0.00
NEI n=16	11	68.75	3	18.75	0	0.00	0	0.00	2	12.50
PSYCL n=46	13	28.26	30	65.22	3	6.52	0	0.00	0	0.00
TOTAL		22.83		66.93		4.72		3.15		2.36
DAI n=4	0	0.00	3	75.00	1	25.00	0	0.00	0	0.00
CIJE/RIE n=14	3	21.43	11	78.57	0	0.00	0	0.00	0	0.00
PSYCA n=27	14	51.85	12	44.44	1	3.70	0	0.00	0	0.00
TOTAL		37.78		57.78		4.44		0.00		0.00

*two users checked both "graduate" and "staff."

and 37.78% of the print users gave this as their status. The source that had the greatest percentage of undergraduates as users was NEI, 68.75%. The source with the next greatest percentage was PSYCA; 51.85% of its users checked "undergraduate." Not surprising was the fact that none of the DAO or DAI users were undergraduates. Faculty constituted the third largest category of user, 4.76% of the CD-ROM users and 4.44% of the print users. A smaller percentage of users identified themselves as either "staff" or "other." Three CD-ROM users (2.38%) checked "staff" as their status; two of them had also checked "graduate." Three CD-ROM users gave "other" as their status (users were not asked to describe what "other" meant). None of the print users identified themselves as "staff" or "other." When compared with UGA Fall Quarter 1989 enrollment figures, the data indicate that a higher percentage of the CD-ROM and print users are graduate students; 4961 of the 27,448

Figure 3 Source Used by Status

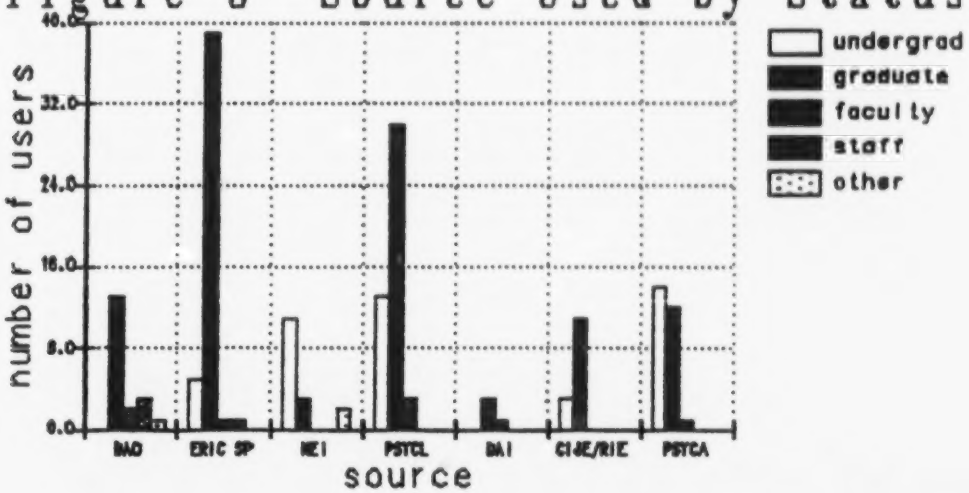


Table 12a

Students' Majors

major	DAO	ERIC SP	NEI	PSYCL	DAI	CIJE/RIE	PSYCA
Accounting	1	0	1	0	0	0	0
Adult Ed.	1	0	0	0	0	0	0
Advertising	0	0	1	0	0	0	0
Biochemistry	0	0	1	0	0	0	0
Business Ed.	0	0	0	0	0	1	0
Chemistry	0	0	1	0	0	0	0
Child & Family Dev.	0	1	0	1	0	0	0
Clinical Psychology	0	0	0	4	0	0	1
Computer-based Ed.	0	2	0	0	0	0	0
Counseling	1	2	0	5	0	1	1
Criminal Justice	0	1	0	0	0	0	0
Curriculum	2	0	0	0	0	0	0
Early Childhood Ed.	0	2	0	0	0	0	1
Education	1	4	0	0	0	2	0
Ed. Admin.	1	0	0	0	0	2	0
Ed. Psychology	0	1	0	3	1	0	2
Elementary Ed.	0	1	0	0	0	0	0
English	0	0	1	0	0	0	1
ESL	0	1	0	0	0	0	0
Higher Ed.	0	2	0	0	0	0	0
Indus. Psychology	0	0	0	3	0	0	0
Instructional Tech.	0	3	0	0	0	0	0
Journalism	0	1	1	0	0	0	0
Language Ed.	0	4	0	0	0	0	0
Library Science	1	0	0	0	0	0	0

Table 12b

Students' Majors

major	DAO	ERIC SP	NEI	PSYCL	DAI	CIJE/RIE	PSYCA
Marketing	0	0	3	1	0	0	0
Mass Communication	1	0	0	0	0	1	0
Mathematics Ed.	0	1	0	0	0	1	0
Music Therapy	0	1	0	0	0	0	0
Music	0	0	0	0	1	0	0
Music Ed.	0	0	0	0	1	0	1
Nursing	0	0	0	1	0	0	0
Operations Mgt.	0	0	1	0	0	0	0
Physical Ed.	0	1	0	1	0	0	0
Political Science	0	1	2	0	0	0	0
Psychology	0	4	0	18	0	0	11
Public Relations	0	0	0	1	0	0	0
Reading Ed	0	0	0	0	0	1	0
Rehabilitation	0	1	0	0	0	0	1
Religion	2	0	0	0	0	0	0
Rhetoric	0	1	0	0	0	0	0
Science Ed	0	1	0	0	0	0	0
Social Science Ed.	0	1	0	0	0	1	0
Social Work	0	0	0	2	0	1	3
Special Ed	0	2	0	0	0	4	1
Speech Communication	0	2	0	2	0	0	0
Speech Pathology	0	0	0	0	0	0	1
Student Personnel	0	0	0	1	0	0	0
Telecommunications	0	0	1	0	0	0	0
Unspecified/n.a.	1	3	1	0	0	0	0
Vocational Ed.	1	0	0	0	0	0	0
TOTAL	13	44	14	43	3	15	26

enrolled students, 18.07%, had the status of graduate (University of Georgia, 1990).

Two more questions followed up on the previous question by asking the users to specify their major or department. Students were asked to indicate their major field of study, and faculty and staff members were asked to indicate their department. The results are displayed in Tables 12a, 12b, and 13.

All users were asked to indicate their age within one of five age ranges. The choices were "18-22", "23-29", "30-39", "40-49", and "50+". The results are shown in Table 14; see also Figures 4 and 5. Of the CD-ROM users, 25% were between 18 and 22, 32.26% were between 23 and 29, 21.77% were between 30 and 39,

Table 13

Faculty and Staff Departments

department	DAO	ERIC SP	NEI	PSYCL	DAI	CIJE/RIE	PSYCA
Adult Ed.	0	0	0	0	0	0	1
Coop. Ext. Service	1	0	0	0	0	0	0
Ed. Psychology	0	0	0	1	0	0	0
Elementary Ed.	0	0	0	0	1	0	0
Forest Resources	1	0	0	0	0	0	0
Main Library	1	0	0	0	0	0	0
Occupational Therapy	0	0	0	1	0	0	0
Physical Plant	0	1	0	0	0	0	0
Psychology	0	0	0	1	0	0	0
Science Library	1	0	0	0	0	0	0
Telecommunications	0	1	0	0	0	0	0
TOTAL	4	2	0	3	1	0	1

Table 14

Age of Users

	18 - 22		23 - 29		30 - 39		40 - 49		50+	
source	n	%	n	%	n	%	n	%	n	%
DAO n=17	1	5.88	1	5.88	4	23.53	10	58.82	1	5.88
ERIC SP n=45	7	15.56	13	28.89	16	35.56	8	17.78	1	2.22
NEI n=16	10	62.50	6	37.50	0	0.00	0	0.00	0	0.00
PSYCL n=46	13	28.26	20	43.48	7	15.22	5	10.87	1	2.17
TOTAL		25.00		32.26		21.77		18.55		2.42
DAI n=4	0	0.00	1	25.00	1	25.00	1	25.00	1	25.00
CIJE/RIE n=14	3	21.43	4	28.57	5	35.71	2	14.29	0	0.00
PSYCA n=27	11	40.74	7	25.93	7	25.93	1	3.70	1	3.70
TOTAL		31.11		26.67		28.89		8.89		4.44

Figure 4 Age of CD-ROM Users

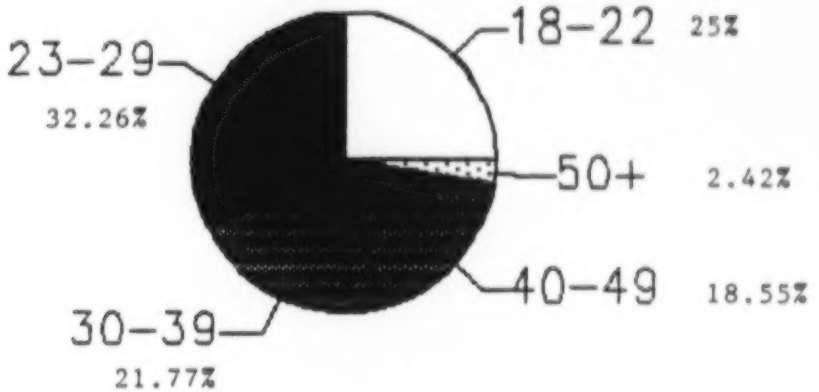
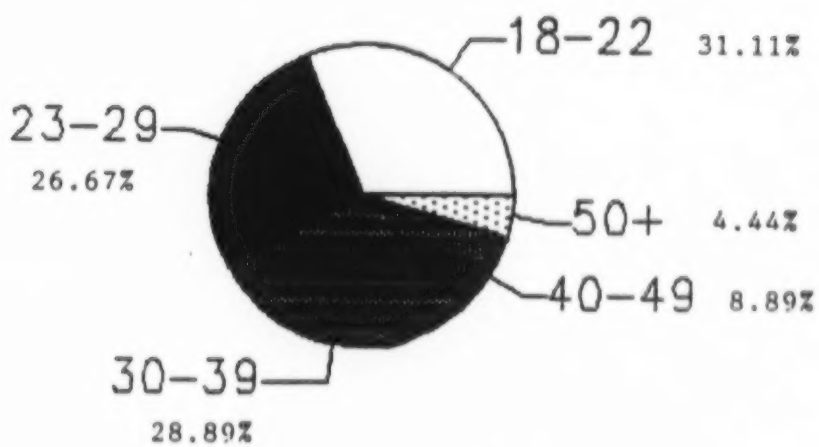


Figure 5 Age of Print Users



18.55% were between 40 and 49, and 2.42% were 50 or older. Of the print users, 31.11% were between 18 and 22, 26.67% were between 23 and 29, 28.89% were between 30 and 39, 8.89% were between 40 and 49, and 4.44% were 50 or older. The results indicate a slight tendency for the CD-ROM users to be older than the print users; for example, 72.58% of the CD-ROM users are between 23 and 49, compared to 64.45% of the print users. The majority, however, of both CD-ROM (57.26%) and print (57.78%) users are between 18 and 22. When compared to the UGA enrollment figures for the Fall 1989 quarter, this sample of CD-ROM users and print index users is older than the student population as a whole. For example, 87.44% of UGA students were between 18 and 29, 8.23% were between 30 and 39, 3.49% were between 40 and 49, and only 0.62% were 50 or older (University of Georgia, 1990).

The great majority of both CD-ROM and index users are female: 69.11% of the CD-ROM sources and 82.22% of the print sources. Females constituted the majority of the users of every source, with the exception of NEI, which had a majority of male users (75%). Thus, when NEI is excluded from the calculating, the percentage of female CD-ROM users rises to 75.7%, which is still less than the percentage of print users, 82.22%. When compared to UGA data, a higher percentage of the users in this study are female; 53.54% of all UGA students during Fall Quarter 1989 were female and 54.32% of the graduate students were female (University of Georgia, 1990).

9. Are users aware that the CD-ROM systems and print indexes may yield citations to sources that the library may not own?

Table 16 displays the results of a question in which the

Figure 6 Gender of CD-ROM Users

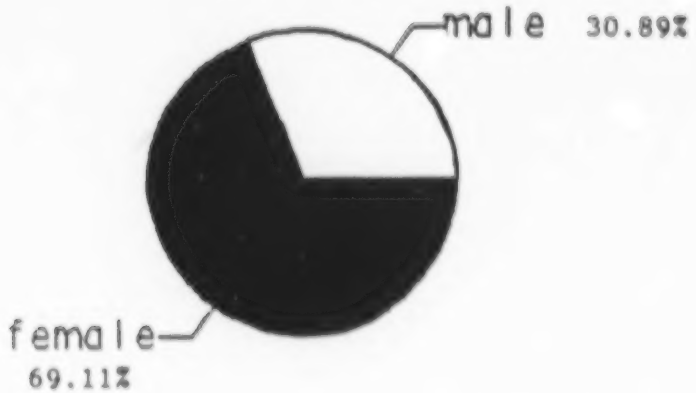
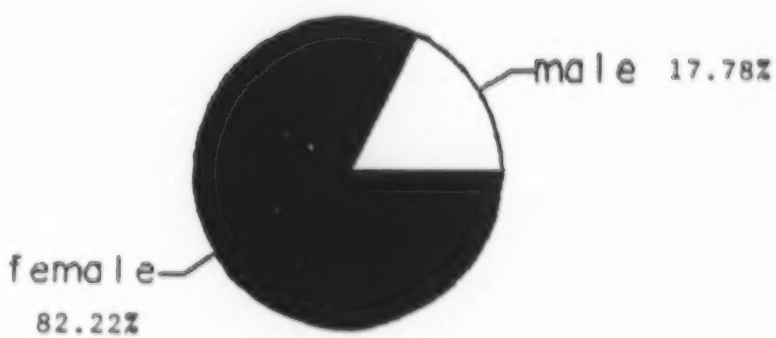


Figure 7 Gender of Print Users



users were asked to indicate which choice best described the source that they were using. The choices were "includes only materials that are owned by the UGA Libraries," "includes materials that may or may not be owned by the UGA Libraries," and

Table 15

Gender of Users

	MALE		FEMALE	
source	n	%	n	%
DAO n=17	6	35.29	11	64.71
ERIC SP n=44*	11	25.00	33	75.00
NEI n=16	12	75.00	4	25.00
PSYCL n=46	9	19.57	37	80.43
TOTAL		30.89		69.11
(-Newsbank)		24.30		75.70
DAI n=4	0	0.00	4	100.00
CIJE/RIE n=14	2	14.29	12	85.71
PSYCA n=27	6	22.22	21	77.78
TOTAL		17.78		82.22

*one questionnaire had no response.

"not sure/don't know." The purpose of this question was to measure whether or not users are aware that the CD-ROM systems and print indexes are tools that give citations to sources that are not always found in the library. The results indicate that

Table 16

Users' Knowledge of Contents and Limitations of Sources

	OWNED BY UGA		MAY OR MAY NOT		NOT SURE	
source	n	%	n	%	n	%
DAO n=17	0	0.00	17	100.00	0	0.00
ERIC SP n=44*	4	9.09	34	77.27	6	13.64
NEI n=16	6	37.50	3	18.75	7	43.75
PSYCL n=46	1	2.17	36	78.26	9	19.57
TOTAL		8.94		73.17		17.89
DAI n=4	1	25.00	3	75.00	0	0.00
CIJE/RIE n=14	2	14.29	8	57.14	4	28.57
PSYCA n=27	1	3.70	19	70.37	7	25.93
TOTAL		8.89		66.67		24.44

OWNED BY UGA: "includes only materials that are owned by the UGA Libraries"; MAY OR MAY NOT: "includes materials that may or may not be owned by the UGA Libraries"; NOT SURE: "not sure/don't know."

*one questionnaire had no response.

most users are aware of this fact. DAO users were the most knowledgable; 17 (100%) indicated the correct response. ERIC SP, PSYCL, DAI and PSYCA users were also very knowledgable on this question, with 77.27%, 78.26%, 75% and 70.37% respectively choosing the "may or may not" answer. CIJE/RIE users, however, were more unsure (28.57%), and fewer of them gave the correct response (57.14%). NEI users were the least knowledgable; only 18.75% of NEI users answered "may or may not" and 37.5% gave the "owned by UGA" choice (which is not the case; UGA Main Library subscribes to most, but not all, of the Newsbank microfiche). NEI users were most likely to be unsure or not know (43.75%).

10. Do users feel that they are usually successful with their searches?

Users who had previously searched the sources were asked if they were "usually successful at getting the information" that they needed (see Table 17). Users indicated that they have been very successful with their sources. There was almost no difference between the two groups; 92.93% of the CD-ROM users and 94.29% of the print users responded "yes" to this question. Regarding the individual sources, the least successful were users of NEI; only 71.43% responded "yes." Thus, more than one fourth were usually unsuccessful. Among the print sources, the least successful were users of DAI; 75% responded "yes." This figure is based upon a low number of actual users (four), however, hindering valid conclusions. All other sources had percentages of 94.12% or higher. "No" was the response of 7.07% of the CD-ROM users and 5.71% of the print users.

11. Do users feel that the guides, user's manuals, and help screens are adequate?

All users were asked if the guides, and for the CD-ROM users, the user's manuals and help screens, were "adequate." A great majority felt that they were adequate (see Table 18); 89.08% of the CD-ROM users and 95.24% of the print users answered "yes" to this question. The source with the greatest percentage

Table 17

Number of Users Who Are Usually Successful When Searching Their Source

	YES		NO	
source	n	%	n	%
DAO n=11	11	100.00	0	0.00
ERIC SP n=34*	32	94.12	2	5.88
NEI n=14	10	71.43	4	28.57
PSYCL n=40	39	97.50	1	2.50
TOTAL		92.93		7.07
DAI n=4	3	75.00	1	25.00
CIJE/RIE n=7*	7	100.00	0	0.00
PSYCA n=24	23	95.83	1	4.17
TOTAL		94.29		5.71

*two users wrote in "50-50" as their answer

of users who did not feel that these aides are adequate is NEI; 25% responded "no." The next highest percentage was from the users of ERIC SP; 11.63% responded no. Comments were not sought on this question, but a few were written in. One ERIC SP user who had checked "yes" wrote in "except for cross referencing."

Table 18

Number of Users Indicating That Guides, User's Manuals and Help Screens Are Adequate

	YES		NO	
source	n	%	n	%
DAO n=17	16	94.12	1	5.88
ERIC SP n=43*	38	88.37	5	11.63
NEI n=16	12	75.00	4	25.00
PSYCL n=43*	40	93.02	3	6.98
TOTAL		89.08		10.92
DAI n=4	4	100.00	0	0.00
CIJE/RIE n=13*	13	100.00	0	0.00
PSYCA n=25*	23	92.00	2	8.00
TOTAL		95.24		4.76

*some users gave no answer.

One NEI user who had checked "yes" wrote in "usually." A DAO user who had checked "no" wrote "they are not very user friendly."

Conclusions

The results of the survey suggest that there are indeed users searching the CD-ROM systems who have not previously used their print counterparts; one third were not aware of their existence. In addition, fewer than one fifth of the CD-ROM users had ever used Sherlock or had a database search done by a librarian. CD-ROM users, especially ERIC SP and PSYCL users, search these sources more often than the print users search the print indexes. Half of the CD-ROM users search at least once per month. Term papers and class assignments were the most common purposes for both CD-ROM and print users. Most DAI and DAO users were working on a thesis or dissertation. CD-ROM users were more likely than the print users to have more than one purpose when searching. Almost all users have used the online catalog; CD-ROM users were more likely than the print users to have used InfoTrac, Sherlock, and other CD-ROM databases in the library.

Most users were aware of the alternative format of their source; the majority of PSYCA and NEI users, however, were not aware of the alternative format. CD-ROM users search the print format less often than the print users search the CD-ROMs. Half of PSYCL users and more than one third of ERIC SP users reported that they no longer use the print indexes. Most CD-ROM users reported that they used the CD-ROM systems instead of the print because they are faster. Ease of use, the inclusion of many

years, and the ability to print the results online were other popular reasons for the CD-ROM users. Although most users did not give "more current" as a reason, almost one fourth did, suggesting that many users may be unaware that currency is not an advantage over the print indexes. For the print users, the most cited reason for using the print indexes was that the CD-ROM was being used. Almost one third of print users felt that the print indexes were easier to use and easier for browsing. Very few CD-ROM and print users searched their particular source because a librarian or professor recommended it.

The majority of users of each source except NEI were graduate students; very few users in this survey were faculty or staff. Both print and CD-ROM users were older and more likely to be female than the general UGA student population. NEI differed from all of the sources in that its users tended to be younger, male undergraduates. ERIC SP and PSYCL are used by students in non-education and non-psychology departments. Most users knew that the CD-ROMs and print indexes may yield citations to sources not held by the UGA Libraries; however, almost one third of the users were unaware of this fact. Most users felt that they were usually successful with their searches; NEI users were least likely to feel usually successful. The great majority of users feel that the guides, user's manuals, and help screens are "adequate." Print users were more likely to feel this way than the CD-ROM users; NEI users were least likely to feel that they are adequate.

There are problems and limitations with the methods used in

this study. With the survey method employed, it was virtually impossible to miss the CD-ROM users; it is possible, however, that a user could take a volume of an index outside of the Reference Department and thus be missed by the survey. Another potential problem is that of the nature of use of these sources; it may be that computer users spend a longer amount of time than index users, and more index users may have been missed. Since demand for the computers is very high, users probably stay longer; length of time searching was not studied, however. Another population of CD-ROM users being missed are the users of ERIC SP in the Center for Educational Technology in the Aderhold education building.

The results of the questions displayed in Tables 17 and 18 may have yielded more useful data if a Likert scale had been used, rather than "yes" or "no". Finally, a larger survey sample of users, especially of the print users, may have yielded more accurate results.

Recommendations

Due to the lower number of print users than CD-ROM, the data suggest that the CD-ROM sources are being used more often. Regarding NI in particular, the fact that not one user was found to be using it over a six month period raises questions concerning its usefulness and cost-effectiveness for the Main Library. Since more users use the CD-ROM format, perhaps the print subscription should be cancelled, if the particulars of the contract allow it. The same could be said of DAI as well; users wanting the most current citations could have their CD-ROM

searches supplemented with an online search. Several libraries have instituted such a service (Charles & Clark, 1990).

NEI users were most likely to believe that their searches were usually unsuccessful; they were also most likely to feel that the user's manuals and help screens are not adequate. The user's manuals should be evaluated in order to develop a more helpful guide to the system. Other user-friendly CD-ROM systems intended for the undergraduate user should be considered for purchase by UGA.

In instruction and when answering reference questions, reference librarians should be sure to point out the CD-ROM systems as well as the traditional print sources. More CD-ROM workstations should be installed, as the demand is so high; 47.83% of print users reported that they were using the print indexes because the computer was being used. (Subsequent to the finishing of this study, new workstations have been added).

Recommendations for further study include conducting a study of Agricola, Medline, and other users at the Science Library; conducting a study of the newer sources, such as MLA Bibliography and Sociofile, that have been installed in the Main Library; and including "offsite" users, such as the ERIC SP users in Aderhold. Studying the length of time that users search, and analyzing the factors related to frequency of use and other variables would be a useful contribution to the literature.

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Appendix A

QUESTIONNAIRE

1. Identify the computer system that you are using.

_____

2. Which choice best describes the contents of this system?

includes only materials that are owned by the UGA Libraries ____
includes materials that **may or may not** be owned by the UGA Libraries ____
not sure/don't know ____

3. How often do you use this system?

more than once per week ____
about once per week ____
about once per month ____
about once per quarter ____
less than once per quarter ____
this is the first time ____(skip to #5)

4. For what purpose do you usually use this system?

term paper ____
class assignment ____
Honors/Masters thesis ____
dissertation ____
research for a publication ____
other ____

5. For what purpose are you using it at this moment?

term paper ____
class assignment ____
Honors/Masters thesis ____
dissertation ____
research for a publication ____
other ____

6. If you've used this system before, are you usually successful at getting the information you need?

yes ____
no ____

7. Are the user's manual, guides, and help screens adequate?

yes ____
no ____

8. Did you know that there is a print (non-computer) version of this system?

yes ____
no ____ (skip to #12)

9. How often do you use the printed version?

more than once per week ____
about once per week ____
about once per month ____
about once per quarter ____
less than once per quarter ____
don't use it anymore ____ (skip to #11)

10. Do you use this system more often than the index?

yes ___
no ___

11. Why are you using the computer rather than the print version? (Check all that apply):

it's faster ____
more current ____
easier to use ____
can search more years at once ____
contains more types of sources ____
can be searched in more ways ____
print source was being used ____
the librarian recommended it ____
a professor, colleague or friend recommended it ____
I can print out the information rather than write it down ____
other (please describe) _____

12. What other computer systems in the library have you used? (Check all that apply):

online catalog ____
Infotrac ____
Sherlock ____
database search done by a librarian ____
other (please describe) _____
none ____

PERSONAL DATA

13. Which category best describes you?

undergraduate _____
graduate _____
faculty _____
staff _____
other _____

14. If you are a **student**, what is your major field of study?

_____

15. If you are a member of the **faculty** or **staff**, what is your department?

_____

16. Age

18-22 ____
23-29 ____
30-39 ____
40-49 ____
50+ ____

17. Sex

male ____
female ____

THANK YOU!!

Appendix B

QUESTIONNAIRE

1. Identify the index that you are using.

_____

2. Which choice best describes the contents of this index?

includes only materials that are owned by the UGA Libraries ____
includes materials that **may or may not** be owned by the UGA Libraries ____
not sure/don't know ____

3. How often do you use this index?

more than once per week ____
about once per week ____
about once per month ____
about once per quarter ____
less than once per quarter ____
this is the first time ____(skip to #5)

4. For what purpose do you usually use this index?

term paper ____
class assignment ____
Honors/Masters thesis ____
dissertation ____
research for a publication ____
other ____

5. For what purpose are you using it at this moment?

term paper ____
class assignment ____
Honors/Masters thesis ____
dissertation ____
research for a publication ____
other ____

6. If you've used this index before, are you usually successful at getting the information you need?

yes ____
no ____

7. Are the guides adequate?

yes ____
no ____

8. Did you know that there is a computerized version of this index?

yes ____
no ____ (skip to #12)

9. How often do you use the computerized version?

more than once per week ____
about once per week ____
about once per month ____
about once per quarter ____
less than once
per quarter ____
don't use it anymore ____ (skip to #11)

10. Do you use this index more often than the computer?

yes ___
no ___

11. Why are you using the index rather than the computer version? (Check all that apply):

more current ____
easier to use ____
can "browse" easier ____
includes more years ____
contains more types of sources ____
computer was being used ____
computer was down ____
I'm more comfortable with it ____
the librarian recommended it ____
a professor, colleague or friend recommended it ____
other (please describe) _____

12. What other computer systems in the library have you used? (Check all that apply):

online catalog ____
Infotrac ____
Sherlock ____
database search
done by a librarian ____
other (please describe) _____
none ____

PERSONAL DATA

13. Which category best describes you?

undergraduate _____
graduate _____
faculty _____
staff _____
other _____

14. If you are a **student**, what is your major field of study?

_____

15. If you are a member of the **faculty** or **staff**, what is your department?

_____

16. Age

18-22 ____
23-29 ____
30-39 ____
40-49 ____
50+ ____

17. Sex

male ____
female ____

THANK YOU!!

Appendix C

LIBRARY USE STUDY QUESTIONNAIRE

Dear Library User:

Participation in this research study is entirely voluntary. This study is being conducted by Lawrence Compton, Reference Librarian, UGA Libraries. You may withdraw from this study at any time with no penalty.

The purpose of this study is to measure the library use patterns of certain computer and print sources in the Main Library Reference Dept. The results will help to improve library services. If you choose to participate, you only have to answer a few questions on this survey form. The results will be anonymous.

I will answer any questions about this research study.

Thank you!

Lawrence Compton
Reference Department
UGA Libraries
542-8460

*Research at the University of Georgia which involves human participants is carried out under the oversight of the Institutional Review Board. Questions or problems regarding these activities should be addressed to Ms. Heidi L. Roof, Coordinator, Human Subjects Research, Institutional Review Board, Office of VP for Research, The University of Georgia, 604A Graduate Studies Research Center, Athens, GA 30602, 542-6514.